

SEQUENCE LISTING

<110> HILTUNEN, Kalervo

<120> A method to control cellular (3R)-hydroxyacyl-CoA esters, precursor molecules for polyhydroxyalkanoate synthesis in genetically modified organisms

<130> 0365-0528P

<140> UNASSIGNED

<141> 2002-02-01

<150> 19991667

<151> 1999-08-03

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<170> PatentIn Ver. 2.1

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Glu Ala Glu Ile Ser Thr Asn Lys Asp Gln Ala Ala Leu Tyr Arg Leu
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Ser Gly Asp Phe Asn Pro Leu His Ile Asp Pro Thr Leu Ala Lys Ala
805 810 815

Val Lys Phe Pro Thr Pro Ile Leu His Gly Leu Cys Thr Leu Gly Ile
820 825 830

Ser Ala Lys Ala Leu Phe Glu His Tyr Gly Pro Tyr Glu Glu Leu Lys
835 840 845

Val Arg Phe Thr Asn Val Val Phe Pro Gly Asp Thr Leu Lys Val Lys
850 855 860

Ala Trp Lys Gln Gly Ser Val Val Val Phe Gln Thr Ile Asp Thr Thr
865 870 875 880

Arg Asn Val Ile Val Leu Asp Asn Ala Ala Val Lys Leu Ser Gln Ala
885 890 895

Lys Ser Lys Leu
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<210> 18
<211> 900
<212> PRT
<213> *Saccharomyces cerevisiae*

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Ala Gly Gly Gly Leu Gly Lys Val Tyr Ala Leu Ala Tyr Ala Ser Arg
20 25 30

Gly Ala Lys Val Val Val Asn Asp Leu Gly Gly Thr Leu Gly Gly Ser
35 40 45

Gly His Asn Ser Lys Ala Ala Asp Leu Val Val Asp Glu Ile Lys Lys
50 55 60

Ala Gly Gly Ile Ala Val Ala Asn Tyr Asp Ser Val Asn Glu Asn Gly

370		375		380
Pro Leu Ile Ile Gln Thr Ala Ile Ser Lys Phe Gln Arg Val Asp Ile				
385		390		395 400
Leu Val Asn Asn Ala Gly Ile Leu Arg Asp Lys Ser Phe Leu Lys Met				
	405		410	415
Lys Asp Glu Glu Trp Phe Ala Val Leu Lys Val His Leu Phe Ser Thr				
	420		425	430
Phe Ser Leu Ser Lys Ala Val Trp Pro Ile Phe Thr Lys Gln Lys Ser				
	435		440	445
Gly Phe Ile Ile Asn Thr Thr Ser Thr Ser Gly Ile Tyr Gly Asn Phe				
	450		455	460
Gly Gln Ala Asn Tyr Ala Ala Ala Lys Ala Ala Ile Leu Gly Phe Ser				
	465		470	475 480
Lys Thr Ile Ala Leu Glu Gly Ala Lys Arg Gly Ile Ile Val Asn Val				
	485		490	495
Ile Ala Pro His Ala Glu Thr Ala Met Thr Lys Thr Ile Phe Ser Glu				
	500		505	510
Lys Glu Leu Ser Asn His Phe Asp Ala Ser Gln Val Ser Pro Leu Val				
	515		520	525
Val Leu Leu Ala Ser Glu Glu Leu Gln Lys Tyr Ser Gly Arg Arg Val				
	530		535	540
Ile Gly Gln Leu Phe Glu Val Gly Gly Gly Trp Cys Gly Gln Thr Arg				
	545		550	555 560
Trp Gln Arg Ser Ser Gly Tyr Val Ser Ile Lys Glu Thr Ile Glu Pro				
	565		570	575
Glu Glu Ile Lys Glu Asn Trp Asn His Ile Thr Asp Phe Ser Arg Asn				
	580		585	590
Thr Ile Asn Pro Ser Ser Thr Glu Glu Ser Ser Met Ala Thr Leu Gln				
	595		600	605
Ala Val Gln Lys Ala His Ser Ser Lys Glu Leu Asp Asp Gly Leu Phe				
	610		615	620
Lys Tyr Thr Thr Lys Asp Cys Ile Leu Tyr Asn Leu Gly Leu Gly Cys				
	625		630	635 640
Thr Ser Lys Glu Leu Lys Tyr Thr Tyr Glu Asn Asp Pro Asp Phe Gln				
	645		650	655
Val Leu Pro Thr Phe Ala Val Ile Pro Phe Met Gln Ala Thr Ala Thr				
	660		665	670
Leu Ala Met Asp Asn Leu Val Asp Asn Phe Asn Tyr Ala Met Leu Leu				

675					680					685					
His	Gly	Glu	Gln	Tyr	Phe	Lys	Leu	Cys	Thr	Pro	Thr	Met	Pro	Ser	Asn
	690					695					700				
Gly	Thr	Leu	Lys	Thr	Leu	Ala	Lys	Pro	Leu	Gln	Val	Leu	Asp	Lys	Asn
705					710					715					720
Gly	Lys	Ala	Ala	Leu	Val	Val	Gly	Gly	Phe	Glu	Thr	Tyr	Asp	Ile	Lys
				725					730					735	
Thr	Lys	Lys	Leu	Ile	Ala	Tyr	Asn	Glu	Gly	Ser	Phe	Phe	Ile	Arg	Gly
			740					745					750		
Ala	His	Val	Pro	Pro	Glu	Lys	Glu	Val	Arg	Asp	Gly	Lys	Arg	Ala	Lys
		755					760					765			
Phe	Ala	Val	Gln	Asn	Phe	Glu	Val	Pro	His	Gly	Lys	Val	Pro	Asp	Phe
	770					775					780				
Glu	Ala	Glu	Ile	Ser	Thr	Asn	Lys	Asp	Gln	Ala	Ala	Leu	Tyr	Arg	Leu
785					790					795					800
Ser	Gly	Asp	Phe	Asn	Pro	Leu	His	Ile	Asp	Pro	Thr	Leu	Ala	Lys	Ala
				805					810					815	
Val	Lys	Phe	Pro	Thr	Pro	Ile	Leu	His	Gly	Leu	Cys	Thr	Leu	Gly	Ile
			820					825					830		
Ser	Ala	Lys	Ala	Leu	Phe	Glu	His	Tyr	Gly	Pro	Tyr	Glu	Glu	Leu	Lys
		835					840					845			
Val	Arg	Phe	Thr	Asn	Val	Val	Phe	Pro	Gly	Asp	Thr	Leu	Lys	Val	Lys
	850					855					860				
Ala	Trp	Lys	Gln	Gly	Ser	Val	Val	Val	Phe	Gln	Thr	Ile	Asp	Thr	Thr
865					870					875					880
Arg	Asn	Val	Ile	Val	Leu	Asp	Asn	Ala	Ala	Val	Lys	Leu	Ser	Gln	Ala
				885					890					895	
Lys	Ser	Lys	Leu												
			900												

<210> 19

<212> PRT

<400> 19

Gly Gly Gly Leu Gly Lys Tyr Tyr Ser Leu Glu Phe Ala Lys Leu Gly
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Ala	Lys	Val	Val	Val	Asn	Asp	Leu	Gly	Gly	Ala	Leu	Asn	Gly	Gln	Gly
		35					40					45			
Gly	Asn	Ser	Lys	Ala	Ala	Asp	Val	Val	Val	Asp	Glu	Ile	Val	Lys	Asn
	50	4				55					60				
Gly	Gly	Val	Ala	Val	Ala	Asp	Tyr	Asn	Asn	Val	Leu	Asp	Gly	Asp	Lys
	65				70					75					80
Ile	Val	Glu	Thr	Ala	Val	Lys	Asn	Phe	Gly	Thr	Val	His	Val	Ile	Ile
				85					90					95	
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Ala	Ser	Met	Lys	Lys	Met	Thr	Glu
			100					105					110		
Lys	Asp	Tyr	Lys	Leu	Val	Ile	Asp	Val	His	Leu	Asn	Gly	Ala	Phe	Ala
		115					120					125			
Val	Thr	Lys	Ala	Ala	Trp	Pro	Tyr	Phe	Gln	Lys	Gln	Lys	Tyr	Gly	Arg
	130					135					140				
Ile	Val	Asn	Thr	Ser	Ser	Pro	Ala	Gly	Leu	Tyr	Gly	Asn	Phe	Gly	Gln
	145			150					155						160
Ala	Asn	Tyr	Ala	Ser	Ala	Lys	Ser	Ala	Leu	Leu	Gly	Phe	Ala	Glu	Thr
				165					170					175	
Leu	Ala	Lys	Glu	Gly	Ala	Lys	Tyr	Asn	Ile	Lys	Ala	Asn	Ala	Ile	Ala
			180					185					190		
Pro	Leu	Ala	Arg	Ser	Arg	Met	Thr	Glu	Ser	Ile	Leu	Pro	Pro	Pro	Met
		195					200					205			
Leu	Glu	Lys	Leu	Gly	Pro	Glu	Lys	Val	Ala	Pro	Leu	Val	Leu	Tyr	Leu
	210					215					220				
Ser	Ser	Ala	Glu	Asn	Glu	Leu	Thr	Gly	Gln	Phe	Phe	Glu	Val	Ala	Ala
	225				230					235					240
Gly	Phe	Tyr	Ala	Gln	Ile	Arg	Trp	Glu	Arg	Ser	Gly	Gly	Val	Leu	Phe
				245				250						255	
Lys	Pro	Asp	Gln	Ser	Phe	Thr	Ala	Glu	Val	Val	Ala	Lys	Arg	Phe	Ser
			260					265					270		
Glu	Ile	Leu	Asp	Tyr	Asp	Asp	Ser	Arg	Lys	Pro	Glu	Tyr	Leu	Lys	Asn
		275					280					285			
Gln	Tyr	Pro	Phe	Met	Leu	Asn	Asp	Tyr	Ala	Thr	Leu	Thr	Asn	Glu	Ala
	290					295					300				
Arg	Lys	Leu	Pro	Ala	Asn	Asp	Ala	Ser	Gly	Ala	Pro	Thr	Val	Ser	Leu
	305				310					315					320
Lys	Asp	Lys	Val	Val	Leu	Ile	Thr	Gly	Ala	Gly	Ala	Gly	Leu	Gly	Lys
				325					330					335	

10060230 06209001

Glu	Tyr	Ala	Lys	Trp	Phe	Ala	Lys	Tyr	Gly	Ala	Lys	Val	Val	Val	Asn	
			340					345					350			
Asp	Phe	Lys	Asp	Ala	Thr	Lys	Thr	Val	Asp	Glu	Ile	Lys	Ala	Ala	Gly	
		355					360					365				
Gly	Glu	Ala	Trp	Pro	Asp	Gln	His	Asp	Val	Ala	Lys	Asp	Ser	Glu	Ala	
	370					375					380					
Ile	Ile	Lys	Asn	Val	Ile	Asp	Lys	Tyr	Gly	Thr	Ile	Asp	Ile	Leu	Val	
385					390					395					400	
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Arg	Ser	Phe	Ala	Lys	Met	Ser	Lys	
				405					410					415		
Gln	Glu	Trp	Asp	Ser	Val	Gln	Gln	Val	His	Leu	Ile	Gly	Thr	Phe	Asn	
			420					425					430			
Leu	Ser	Arg	Leu	Ala	Trp	Pro	Tyr	Phe	Val	Glu	Lys	Gln	Phe	Gly	Arg	
		435					440					445				
Ile	Ile	Asn	Ile	Thr	Ser	Thr	Ser	Gly	Ile	Tyr	Gly	Asn	Phe	Gly	Gln	
	450					455					460					
Ala	Asn	Tyr	Ser	Ser	Ser	Lys	Ala	Gly	Ile	Leu	Gly	Leu	Ser	Lys	Thr	
465					470					475					480	
Met	Ala	Ile	Glu	Gly	Ala	Lys	Asn	Asn	Ile	Lys	Val	Asn	Ile	Val	Ala	
				485					490					495		
Pro	His	Ala	Glu	Thr	Ala	Met	Thr	Leu	Thr	Ile	Phe	Arg	Glu	Gln	Asp	
			500					505					510			
Lys	Asn	Leu	Tyr	His	Ala	Asp	Gln	Val	Ala	Pro	Leu	Leu	Val	Tyr	Leu	
		515					520					525				
Gly	Thr	Asp	Asp	Val	Pro	Val	Thr	Gly	Glu	Thr	Phe	Glu	Ile	Gly	Gly	
	530					535					540					
Gly	Trp	Ile	Gly	Asn	Thr	Arg	Trp	Gln	Arg	Ala	Lys	Gly	Ala	Val	Ser	
545					550					555					560	
His	Asp	Glu	His	Thr	Thr	Val	Glu	Phe	Ile	Lys	Glu	His	Leu	Asn	Glu	
				565					570					575		
Ile	Thr	Asp	Phe	Thr	Thr	Asp	Thr	Glu	Asn	Pro	Lys	Ser	Thr	Thr	Glu	
			580					585					590			
Ser	Ser	Met	Ala	Ile	Leu	Ser	Ala	Val	Gly	Gly	Asp	Asp	Asp	Asp	Asp	
		595					600					605				
Asp	Glu	Asp	Glu	Glu	Glu	Asp	Glu	Gly	Asp	Glu	Glu	Glu	Asp	Glu	Glu	
	610					615					620					
Asp	Glu	Glu	Glu	Asp	Asp	Pro	Val	Trp	Arg	Phe	Asp	Asp	Arg	Asp	Val	
625					630					635					640	

Ile	Leu	Tyr	Asn	Ile	Ala	Leu	Gly	Ala	Thr	Thr	Lys	Gln	Leu	Lys	Tyr	
				645					650					655		
Val	Tyr	Glu	Asn	Asp	Ser	Asp	Phe	Gln	Val	Ile	Pro	Thr	Phe	Gly	His	
			660					665					670			
Leu	Ile	Thr	Phe	Asn	Ser	Gly	Lys	Ser	Gln	Asn	Ser	Phe	Ala	Lys	Leu	
		675					680					685				
Leu	Arg	Asn	Phe	Asn	Pro	Met	Leu	Leu	Leu	His	Gly	Glu	His	Tyr	Leu	
	690					695					700					
Lys	Val	His	Ser	Trp	Pro	Pro	Pro	Thr	Glu	Gly	Glu	Ile	Lys	Thr	Thr	
705					710					715					720	
Phe	Glu	Pro	Ile	Ala	Thr	Thr	Pro	Lys	Gly	Thr	Asn	Val	Val	Ile	Val	
				725					730					735		
His	Gly	Ser	Lys	Ser	Val	Asp	Asn	Lys	Ser	Gly	Glu	Leu	Ile	Tyr	Ser	
			740					745					750			
Asn	Glu	Ala	Thr	Tyr	Phe	Ile	Arg	Asn	Cys	Gln	Ala	Asp	Asn	Lys	Val	
		755					760					765				
Tyr	Ala	Asp	Arg	Pro	Ala	Phe	Ala	Thr	Asn	Gln	Phe	Leu	Ala	Pro	Lys	
	770					775					780					
Arg	Ala	Pro	Asp	Tyr	Gln	Val	Asp	Val	Pro	Val	Ser	Glu	Asp	Leu	Ala	
785					790				795						800	
Ala	Leu	Tyr	Arg	Leu	Ser	Gly	Asp	Arg	Asn	Pro	Leu	His	Ile	Asp	Pro	
			805						810					815		
Asn	Phe	Ala	Lys	Gly	Ala	Lys	Phe	Pro	Lys	Pro	Ile	Leu	His	Gly	Met	
			820					825					830			
Cys	Thr	Tyr	Gly	Leu	Ser	Ala	Lys	Ala	Leu	Ile	Asp	Lys	Phe	Gly	Met	
		835					840					845				
Phe	Asn	Glu	Ile	Lys	Ala	Arg	Phe	Thr	Gly	Ile	Val	Phe	Pro	Gly	Glu	
	850					855					860					
Thr	Leu	Arg	Val	Leu	Ala	Trp	Lys	Glu	Ser	Asp	Asp	Thr	Ile	Val	Phe	
865					870					875					880	
Gln	Thr	His	Val	Val	Asp	Arg	Gly	Thr	Ile	Ala	Ile	Asn	Asn	Ala	Ala	
			885					890						895		
Ile	Lys	Leu	Val	Gly	Asp	Lys	Ala	Lys	Ile							
		900						905								

<210> 20
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 <212> PRT
 <213> Candida tropicalis

<400> 20

Met	Ser	Pro	Val	Asp	Phe	Lys	Asp	Lys	Val	Val	Ile	Ile	Thr	Ser	Ala
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Gly	Gly	Gly	Leu	Gly	Lys	Tyr	Tyr	Ser	Leu	Glu	Phe	Ala	Lys	Leu	Gly
			20					25					30		
Ala	Lys	Val	Val	Val	Asn	Asp	Leu	Gly	Gly	Ala	Leu	Asn	Gly	Gln	Gly
		35					40					45			
Gly	Asn	Ser	Lys	Ala	Ala	Asp	Val	Val	Val	Asp	Glu	Ile	Val	Lys	Asn
	50					55					60				
Gly	Gly	Val	Ala	Val	Ala	Asp	Tyr	Asn	Asn	Val	Leu	Asp	Gly	Asp	Lys
65					70					75					80
Ile	Val	Glu	Thr	Ala	Val	Lys	Asn	Phe	Gly	Thr	Val	His	Val	Ile	Ile
				85					90					95	
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Ala	Ser	Met	Lys	Lys	Met	Thr	Glu
			100					105					110		
Lys	Asp	Tyr	Lys	Leu	Val	Ile	Asp	Val	His	Leu	Asn	Gly	Ala	Phe	Ala
		115					120					125			
Val	Thr	Lys	Ala	Ala	Trp	Pro	Tyr	Phe	Gln	Lys	Gln	Lys	Tyr	Gly	Arg
		130				135						140			
Ile	Val	Asn	Thr	Ser	Ser	Pro	Ala	Gly	Leu	Tyr	Gly	Asn	Phe	Gly	Gln
145					150					155					160
Ala	Asn	Tyr	Ala	Ser	Ala	Lys	Ser	Ala	Leu	Leu	Gly	Phe	Ala	Glu	Thr
				165					170					175	
Leu	Ala	Lys	Glu	Gly	Ala	Lys	Tyr	Asn	Ile	Lys	Ala	Asn	Ala	Ile	Ala
			180					185					190		
Pro	Leu	Ala	Arg	Ser	Arg	Met	Thr	Glu	Ser	Ile	Leu	Pro	Pro	Pro	Met
		195					200					205			
Leu	Glu	Lys	Leu	Gly	Pro	Glu	Lys	Val	Ala	Pro	Leu	Val	Leu	Tyr	Leu
	210					215					220				
Ser	Ser	Ala	Glu	Asn	Glu	Leu	Thr	Gly	Gln	Phe	Phe	Glu	Val	Ala	Ala
225					230					235					240
Gly	Phe	Tyr	Ala	Gln	Ile	Arg	Trp	Glu	Arg	Ser	Gly	Gly	Val	Leu	Phe
				245					250					255	
Lys	Pro	Asp	Gln	Ser	Phe	Thr	Ala	Glu	Val	Val	Ala	Lys	Arg	Phe	Ser
			260					265					270		
Glu	Ile	Leu	Asp	Tyr	Asp	Asp	Ser	Arg	Lys	Pro	Glu	Tyr	Leu	Lys	Asn
		275					280					285			
Gln	Tyr	Pro	Phe	Met	Leu	Asn	Asp	Tyr	Ala	Thr	Leu	Thr	Asn	Glu	Ala
	290					295					300				

Arg	Lys	Leu	Pro	Ala	Asn	Asp	Ala	Ser	Gly	Ala	Pro	Thr	Val	Ser	Leu
305					310					315					320
Lys	Asp	Lys	Val	Val	Leu	Ile	Thr	Gly	Ala	Gly	Ala	Gly	Leu	Gly	Lys
			325						330					335	
Glu	Tyr	Ala	Lys	Trp	Phe	Ala	Lys	Tyr	Gly	Ala	Lys	Val	Val	Val	Asn
			340					345					350		
Asp	Phe	Lys	Asp	Ala	Thr	Lys	Thr	Val	Asp	Glu	Ile	Lys	Ala	Ala	Gly
		355					360					365			
Gly	Glu	Ala	Trp	Pro	Asp	Gln	His	Asp	Val	Ala	Lys	Asp	Ser	Glu	Ala
	370					375					380				
Ile	Ile	Lys	Asn	Val	Ile	Asp	Lys	Tyr	Gly	Thr	Ile	Asp	Ile	Leu	Val
385					390					395					400
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Arg	Ser	Phe	Ala	Lys	Met	Ser	Lys
				405					410					415	
Gln	Glu	Trp	Asp	Ser	Val	Gln	Gln	Val	His	Leu	Ile	Gly	Thr	Phe	Asn
			420					425					430		
Leu	Ser	Arg	Leu	Ala	Trp	Pro	Tyr	Phe	Val	Glu	Lys	Gln	Phe	Gly	Arg
		435					440					445			
Ile	Ile	Asn	Ile	Thr	Ser	Thr	Ser	Gly	Ile	Tyr	Gly	Asn	Phe	Gly	Gln
	450					455					460				
Ala	Asn	Tyr	Ser	Ser	Ser	Lys	Ala	Gly	Ile	Leu	Gly	Leu	Ser	Lys	Thr
465					470					475					480
Met	Ala	Ile	Glu	Gly	Ala	Lys	Asn	Asn	Ile	Lys	Val	Asn	Ile	Val	Ala
			485						490					495	
Pro	His	Ala	Glu	Thr	Ala	Met	Thr	Leu	Thr	Ile	Phe	Arg	Glu	Gln	Asp
			500					505					510		
Lys	Asn	Leu	Tyr	His	Ala	Asp	Gln	Val	Ala	Pro	Leu	Leu	Val	Tyr	Leu
		515					520					525			
Gly	Thr	Asp	Asp	Val	Pro	Val	Thr	Gly	Glu	Thr	Phe	Glu	Ile	Gly	Gly
	530					535					540				
Gly	Trp	Ile	Gly	Asn	Thr	Arg	Trp	Gln	Arg	Ala	Lys	Gly	Ala	Val	Ser
545					550					555					560
His	Asp	Glu	His	Thr	Thr	Val	Glu	Phe	Ile	Lys	Glu	His	Leu	Asn	Glu
			565					570						575	
Ile	Thr	Asp	Phe	Thr	Thr	Asp	Thr	Glu	Asn	Pro	Lys	Ser	Thr	Thr	Glu
			580					585					590		
Ser	Ser	Met	Ala	Ile	Leu	Ser	Ala	Val	Gly	Gly	Asp	Asp	Asp	Asp	Asp
		595					600					605			

Asp	Glu	Asp	Glu	Glu	Glu	Asp	Glu	Gly	Asp	Glu	Glu	Glu	Asp	Glu	Glu	610	615	620
Asp	Glu	Glu	Glu	Asp	Asp	Pro	Val	Trp	Arg	Phe	Asp	Asp	Arg	Asp	Val	625	630	635
Ile	Leu	Tyr	Asn	Ile	Ala	Leu	Gly	Ala	Thr	Thr	Lys	Gln	Leu	Lys	Tyr	645	650	655
Val	Tyr	Glu	Asn	Asp	Ser	Asp	Phe	Gln	Val	Ile	Pro	Thr	Phe	Gly	His	660	665	670
Leu	Ile	Thr	Phe	Asn	Ser	Gly	Lys	Ser	Gln	Asn	Ser	Phe	Ala	Lys	Leu	675	680	685
Leu	Arg	Asn	Phe	Asn	Pro	Met	Leu	Leu	Leu	His	Gly	Glu	His	Tyr	Leu	690	695	700
Lys	Val	His	Ser	Trp	Pro	Pro	Pro	Thr	Glu	Gly	Glu	Ile	Lys	Thr	Thr	705	710	715
Phe	Glu	Pro	Ile	Ala	Thr	Thr	Pro	Lys	Gly	Thr	Asn	Val	Val	Ile	Val	725	730	735
His	Gly	Ser	Lys	Ser	Val	Asp	Asn	Lys	Ser	Gly	Glu	Leu	Ile	Tyr	Ser	740	745	750
Asn	Glu	Ala	Thr	Tyr	Phe	Ile	Arg	Asn	Cys	Gln	Ala	Asp	Asn	Lys	Val	755	760	765
Tyr	Ala	Asp	Arg	Pro	Ala	Phe	Ala	Thr	Asn	Gln	Phe	Leu	Ala	Pro	Lys	770	775	780
Arg	Ala	Pro	Asp	Tyr	Gln	Val	Asp	Val	Pro	Val	Ser	Glu	Asp	Leu	Ala	785	790	795
Ala	Leu	Tyr	Arg	Leu	Ser	Gly	Asp	Arg	Asn	Pro	Leu	His	Ile	Asp	Pro	805	810	815
Asn	Phe	Ala	Lys	Gly	Ala	Lys	Phe	Pro	Lys	Pro	Ile	Leu	His	Gly	Met	820	825	830
Cys	Thr	Tyr	Gly	Leu	Ser	Ala	Lys	Ala	Leu	Ile	Asp	Lys	Phe	Gly	Met	835	840	845
Phe	Asn	Glu	Ile	Lys	Ala	Arg	Phe	Thr	Gly	Ile	Val	Phe	Pro	Gly	Glu	850	855	860
Thr	Leu	Arg	Val	Leu	Ala	Trp	Lys	Glu	Ser	Asp	Asp	Thr	Ile	Val	Phe	865	870	875
Gln	Thr	His	Val	Val	Asp	Arg	Gly	Thr	Ile	Ala	Ile	Asn	Asn	Ala	Ala	885	890	895
Ile	Lys	Leu	Val	Gly	Asp	Lys	Ala	Lys	Ile							900	905	

<210> 21
 <211> 906
 <212> PRT
 <213> *Candida tropicalis*

<400> 21

Met	Ser	Pro	Val	Asp	Phe	Lys	Asp	Lys	Val	Val	Ile	Ile	Thr	Gly	Ala
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Gly	Gly	Gly	Leu	Gly	Lys	Tyr	Tyr	Ser	Leu	Glu	Phe	Ala	Lys	Leu	Gly
			20					25					30		
Ala	Lys	Val	Val	Val	Asn	Asp	Leu	Gly	Gly	Ala	Leu	Asn	Gly	Gln	Gly
		35					40					45			
Gly	Asn	Ser	Lys	Ala	Ala	Asp	Val	Val	Val	Asp	Glu	Ile	Val	Lys	Asn
	50					55					60				
Gly	Gly	Val	Ala	Val	Ala	Asp	Tyr	Asn	Asn	Val	Leu	Asp	Gly	Asp	Lys
65					70					75					80
Ile	Val	Glu	Thr	Ala	Val	Lys	Asn	Phe	Gly	Thr	Val	His	Val	Ile	Ile
				85					90					95	
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Ala	Ser	Met	Lys	Lys	Met	Thr	Glu
			100					105					110		
Lys	Asp	Tyr	Lys	Leu	Val	Ile	Asp	Val	His	Leu	Asn	Gly	Ala	Phe	Ala
	115						120					125			
Val	Thr	Lys	Ala	Ala	Trp	Pro	Tyr	Phe	Gln	Lys	Gln	Lys	Tyr	Gly	Arg
	130					135					140				
Ile	Val	Asn	Thr	Ser	Ser	Pro	Ala	Gly	Leu	Tyr	Gly	Asn	Phe	Gly	Gln
145					150					155					160
Ala	Asn	Tyr	Ala	Ser	Ala	Lys	Ser	Ala	Leu	Leu	Gly	Phe	Ala	Glu	Thr
				165					170					175	
Leu	Ala	Lys	Glu	Gly	Ala	Lys	Tyr	Asn	Ile	Lys	Ala	Asn	Ala	Ile	Ala
			180					185					190		
Pro	Leu	Ala	Arg	Ser	Arg	Met	Thr	Glu	Ser	Ile	Leu	Pro	Pro	Pro	Met
	195						200					205			
Leu	Glu	Lys	Leu	Gly	Pro	Glu	Lys	Val	Ala	Pro	Leu	Val	Leu	Tyr	Leu
	210					215					220				
Ser	Ser	Ala	Glu	Asn	Glu	Leu	Thr	Gly	Gln	Phe	Phe	Glu	Val	Ala	Ala
225					230					235					240
Gly	Phe	Tyr	Ala	Gln	Ile	Arg	Trp	Glu	Arg	Ser	Gly	Gly	Val	Leu	Phe
			245						250					255	
Lys	Pro	Asp	Gln	Ser	Phe	Thr	Ala	Glu	Val	Val	Ala	Lys	Arg	Phe	Ser

260							265					270				
Glu	Ile	Leu	Asp	Tyr	Asp	Asp	Ser	Arg	Lys	Pro	Glu	Tyr	Leu	Lys	Asn	
		275					280					285				
Gln	Tyr	Pro	Phe	Met	Leu	Asn	Asp	Tyr	Ala	Thr	Leu	Thr	Asn	Glu	Ala	
		290				295					300					
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Lys	Asp	Lys	Val	Val	Leu	Ile	Thr	Ser	Ala	Gly	Ala	Gly	Leu	Gly	Lys	
				325					330					335		
Glu	Tyr	Ala	Lys	Trp	Phe	Ala	Lys	Tyr	Gly	Ala	Lys	Val	Val	Val	Asn	
			340					345					350			
Asp	Phe	Lys	Asp	Ala	Thr	Lys	Thr	Val	Asp	Glu	Ile	Lys	Ala	Ala	Gly	
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		370				375					380					
Ile	Ile	Lys	Asn	Val	Ile	Asp	Lys	Tyr	Gly	Thr	Ile	Asp	Ile	Leu	Val	
385					390					395					400	
Asn	Asn	Ala	Gly	Ile	Leu	Arg	Asp	Arg	Ser	Phe	Ala	Lys	Met	Ser	Lys	
			405						410				415			
Gln	Glu	Trp	Asp	Ser	Val	Gln	Gln	Val	His	Leu	Ile	Gly	Thr	Phe	Asn	
			420					425					430			
Leu	Ser	Arg	Leu	Ala	Trp	Pro	Tyr	Phe	Val	Glu	Lys	Gln	Phe	Gly	Arg	
		435					440					445				
Ile	Ile	Asn	Ile	Thr	Ser	Thr	Ser	Gly	Ile	Tyr	Gly	Asn	Phe	Gly	Gln	
		450				455					460					
Ala	Asn	Tyr	Ser	Ser	Ser	Lys	Ala	Gly	Ile	Leu	Gly	Leu	Ser	Lys	Thr	
465					470					475					480	
Met	Ala	Ile	Glu	Gly	Ala	Lys	Asn	Asn	Ile	Lys	Val	Asn	Ile	Val	Ala	
				485					490					495		
Pro	His	Ala	Glu	Thr	Ala	Met	Thr	Leu	Thr	Ile	Phe	Arg	Glu	Gln	Asp	
			500					505					510			
Lys	Asn	Leu	Tyr	His	Ala	Asp	Gln	Val	Ala	Pro	Leu	Leu	Val	Tyr	Leu	
		515					520					525				
Gly	Thr	Asp	Asp	Val	Pro	Val	Thr	Gly	Glu	Thr	Phe	Glu	Ile	Gly	Gly	
		530				535					540					
Gly	Trp	Ile	Gly	Asn	Thr	Arg	Trp	Gln	Arg	Ala	Lys	Gly	Ala	Val	Ser	
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His	Asp	Glu	His	Thr	Thr	Val	Glu	Phe	Ile	Lys	Glu	His	Leu	Asn	Glu	

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865 870 875 880
 Gln Thr His Val Val Asp Arg Gly Thr Ile Ala Ile Asn Asn Ala Ala
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Ile Lys Leu Val Gly Asp Lys Ala Lys Ile
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Ala Lys Val Val Val Asn Asp Leu Gly Gly Ala Leu Asn Gly Gln Gly
 35 40 45

Gly Asn Ser Lys Ala Ala Asp Val Val Val Asp Glu Ile Val Lys Asn
 50 55 60

Gly Gly Val Ala Val Ala Asp Tyr Asn Asn Val Leu Asp Gly Asp Lys
 65 70 75 80

Ile Val Glu Thr Ala Val Lys Asn Phe Gly Thr Val His Val Ile Ile
 85 90 95

Asn Asn Ala Gly Ile Leu Arg Asp Ala Ser Met Lys Lys Met Thr Glu
 100 105 110

Lys Asp Tyr Lys Leu Val Ile Asp Val His Leu Asn Gly Ala Phe Ala
 115 120 125

Val Thr Lys Ala Ala Trp Pro Tyr Phe Gln Lys Gln Lys Tyr Gly Arg
 130 135 140

Ile Val Asn Thr Ser Ser Pro Ala Gly Leu Tyr Gly Asn Phe Gly Gln
 145 150 155 160

Ala Asn Tyr Ala Ser Ala Lys Ser Ala Leu Leu Gly Phe Ala Glu Thr
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Leu Ala Lys Glu Gly Ala Lys Tyr Asn Ile Lys Ala Asn Ala Ile Ala
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Pro Leu Ala Arg Ser Arg Met Thr Glu Ser Ile Leu Pro Pro Pro Met
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Leu Glu Lys Leu Gly Pro Glu Lys Val Ala Pro Leu Val Leu Tyr Leu
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Ser 225	Ser	Ala	Glu	Asn	Glu 230	Leu	Thr	Gly	Gln	Phe 235	Phe	Glu	Val	Ala	Ala 240
Gly	Phe	Tyr	Ala	Gln 245	Ile	Arg	Trp	Glu	Arg 250	Ser	Gly	Gly	Val	Leu 255	Phe
Lys	Pro	Asp	Gln 260	Ser	Phe	Thr	Ala	Glu 265	Val	Val	Ala	Lys	Arg 270	Phe	Ser
Glu	Ile	Leu 275	Asp	Tyr	Asp	Asp	Ser 280	Arg	Lys	Pro	Glu	Tyr 285	Leu	Lys	Asn
Gln	Tyr 290	Pro	Phe	Met	Leu	Asn 295	Asp	Tyr	Ala	Thr	Leu 300	Thr	Asn	Glu	Ala
Arg 305	Lys	Leu	Pro	Ala	Asn 310	Asp	Ala	Ser	Gly	Ala 315	Pro	Thr	Val	Ser	Leu 320
Lys	Asp	Lys	Val	Val 325	Leu	Ile	Thr	Ser	Ala 330	Gly	Ala	Gly	Leu	Gly 335	Lys
Glu	Tyr	Ala	Lys 340	Trp	Phe	Ala	Lys	Tyr 345	Gly	Ala	Lys	Val	Val 350	Val	Asn
Asp	Phe	Lys 355	Asp	Ala	Thr	Lys	Thr 360	Val	Asp	Glu	Ile	Lys 365	Ala	Ala	Gly
Gly	Glu 370	Ala	Trp	Pro	Asp	Gln 375	His	Asp	Val	Ala	Lys 380	Asp	Ser	Glu	Ala
Ile 385	Ile	Lys	Asn	Val	Ile 390	Asp	Lys	Tyr	Gly	Thr 395	Ile	Asp	Ile	Leu	Val 400
Asn	Asn	Ala	Gly	Ile 405	Leu	Arg	Asp	Arg	Ser 410	Phe	Ala	Lys	Met	Ser 415	Lys
Gln	Glu	Trp	Asp 420	Ser	Val	Gln	Gln	Val 425	His	Leu	Ile	Gly	Thr 430	Phe	Asn
Leu	Ser	Arg 435	Leu	Ala	Trp	Pro	Tyr 440	Phe	Val	Glu	Lys	Gln 445	Phe	Gly	Arg
Ile 450	Ile	Asn	Ile	Thr	Ser	Thr 455	Ser	Gly	Ile	Tyr	Gly 460	Asn	Phe	Gly	Gln
Ala 465	Asn	Tyr	Ser	Ser	Ser 470	Lys	Ala	Gly	Ile	Leu 475	Gly	Leu	Ser	Lys	Thr 480
Met	Ala	Ile	Glu	Gly 485	Ala	Lys	Asn	Asn	Ile 490	Lys	Val	Asn	Ile	Val 495	Ala
Pro	His	Ala	Glu 500	Thr	Ala	Met	Thr	Leu 505	Thr	Ile	Phe	Arg	Glu 510	Gln	Asp
Lys	Asn	Leu 515	Tyr	His	Ala	Asp	Gln 520	Val	Ala	Pro	Leu	Leu 525	Val	Tyr	Leu

Gly	Thr	Asp	Asp	Val	Pro	Val	Thr	Gly	Glu	Thr	Phe	Glu	Ile	Gly	Gly		
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Gly	Trp	Ile	Gly	Asn	Thr	Arg	Trp	Gln	Arg	Ala	Lys	Gly	Ala	Val	Ser		
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His	Asp	Glu	His	Thr	Thr	Val	Glu	Phe	Ile	Lys	Glu	His	Leu	Asn	Glu		
				565					570					575			
Ile	Thr	Asp	Phe	Thr	Thr	Asp	Thr	Glu	Asn	Pro	Lys	Ser	Thr	Thr	Glu		
			580					585					590				
Ser	Ser	Met	Ala	Ile	Leu	Ser	Ala	Val	Gly	Gly	Asp	Asp	Asp	Asp	Asp		
		595					600					605					
Asp	Glu	Asp	Glu	Glu	Glu	Asp	Glu	Gly	Asp	Glu	Glu	Glu	Asp	Glu	Glu		
	610					615					620						
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				645					650					655			
Val	Tyr	Glu	Asn	Asp	Ser	Asp	Phe	Gln	Val	Ile	Pro	Thr	Phe	Gly	His		
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Leu	Ile	Thr	Phe	Asn	Ser	Gly	Lys	Ser	Gln	Asn	Ser	Phe	Ala	Lys	Leu		
		675					680					685					
Leu	Arg	Asn	Phe	Asn	Pro	Met	Leu	Leu	Leu	His	Gly	Glu	His	Tyr	Leu		
	690					695					700						
Lys	Val	His	Ser	Trp	Pro	Pro	Pro	Thr	Glu	Gly	Glu	Ile	Lys	Thr	Thr		
705					710					715					720		
Phe	Glu	Pro	Ile	Ala	Thr	Thr	Pro	Lys	Gly	Thr	Asn	Val	Val	Ile	Val		
				725					730					735			
His	Gly	Ser	Lys	Ser	Val	Asp	Asn	Lys	Ser	Gly	Glu	Leu	Ile	Tyr	Ser		
			740					745					750				
Asn	Glu	Ala	Thr	Tyr	Phe	Ile	Arg	Asn	Cys	Gln	Ala	Asp	Asn	Lys	Val		
		755					760					765					
Tyr	Ala	Asp	Arg	Pro	Ala	Phe	Ala	Thr	Asn	Gln	Phe	Leu	Ala	Pro	Lys		
	770					775					780						
Arg	Ala	Pro	Asp	Tyr	Gln	Val	Asp	Val	Pro	Val	Ser	Glu	Asp	Leu	Ala		
785					790					795					800		
Ala	Leu	Tyr	Arg	Leu	Ser	Gly	Asp	Arg	Asn	Pro	Leu	His	Ile	Asp	Pro		
				805					810					815			
Asn	Phe	Ala	Lys	Gly	Ala	Lys	Phe	Pro	Lys	Pro	Ile	Leu	His	Gly	Met		
			820					825					830				

Cys Thr Tyr Gly Leu Ser Ala Lys Ala Leu Ile Asp Lys Phe Gly Met
835 840 845

Phe Asn Glu Ile Lys Ala Arg Phe Thr Gly Ile Val Phe Pro Gly Glu
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Thr Leu Arg Val Leu Ala Trp Lys Glu Ser Asp Asp Thr Ile Val Phe
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Gln Thr His Val Val Asp Arg Gly Thr Ile Ala Ile Asn Asn Ala Ala
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Ala Gly Ala Gly Leu Gly Arg Ala Tyr Ala Leu Ala Phe Ala Glu Arg
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Gly Ala Leu Val Val Val Asn Asp Leu Gly Gly Asp Phe Lys Gly Val
35 40 45

Gly Lys Gly Ser Leu Ala Ala Asp Lys Val Val Glu Glu Ile Arg Arg
50 55 60

Arg Gly Gly Lys Ala Val Ala Asn Tyr Asp Ser Val Glu Glu Gly Glu
65 70 75 80

Lys Val Val Lys Thr Ala Leu Asp Ala Phe Gly Arg Ile Asp Val Val
85 90 95

Val Asn Asn Ala Gly Ile Leu Arg Asp Arg Ser Phe Ala Arg Ile Ser
100 105 110

Asp Glu Asp Trp Asp Ile Ile His Arg Val His Leu Arg Gly Ser Phe
115 120 125

Gln Val Thr Arg Ala Ala Trp Glu His Met Lys Lys Gln Lys Tyr Gly
130 135 140

Arg Ile Ile Met Thr Ser Ser Ala Ser Gly Ile Tyr Gly Asn Phe Gly
145 150 155 160

Gln Ala Asn Tyr Ser Ala Ala Lys Leu Gly Leu Leu Gly Leu Ala Asn
165 170 175

Ser Leu Ala Ile Glu Gly Arg Lys Ser Asn Ile His Cys Asn Thr Ile
180 185 190

Ala	Pro	Asn	Ala	Gly	Ser	Arg	Met	Thr	Gln	Thr	Val	Met	Pro	Glu	Asp	195	200	205
Leu	Val	Glu	Ala	Leu	Lys	Pro	Glu	Tyr	Val	Ala	Pro	Leu	Val	Leu	Trp	210	215	220
Leu	Cys	His	Glu	Ser	Cys	Glu	Glu	Asn	Gly	Gly	Leu	Phe	Glu	Val	Gly	225	230	235
Ala	Gly	Trp	Ile	Gly	Lys	Leu	Arg	Trp	Glu	Arg	Thr	Leu	Gly	Ala	Ile	245	250	255
Val	Arg	Gln	Lys	Asn	His	Pro	Met	Thr	Pro	Glu	Ala	Val	Lys	Ala	Asn	260	265	270
Trp	Lys	Lys	Ile	Cys	Asp	Phe	Glu	Asn	Ala	Ser	Lys	Pro	Gln	Ser	Ile	275	280	285
Gln	Glu	Ser	Thr	Gly	Ser	Ile	Ile	Glu	Val	Leu	Ser	Lys	Ile	Asp	Ser	290	295	300
Glu	Gly	Gly	Val	Ser	Ala	Asn	His	Thr	Ser	Arg	Ala	Thr	Ser	Thr	Ala	305	310	315
Thr	Ser	Gly	Phe	Ala	Gly	Ala	Ile	Gly	Gln	Lys	Leu	Pro	Pro	Phe	Ser	325	330	335
Tyr	Ala	Tyr	Thr	Glu	Leu	Glu	Ala	Ile	Met	Tyr	Ala	Leu	Gly	Val	Gly	340	345	350
Ala	Ser	Ile	Lys	Asp	Pro	Lys	Asp	Leu	Lys	Phe	Ile	Tyr	Glu	Gly	Ser	355	360	365
Ser	Asp	Phe	Ser	Cys	Leu	Pro	Thr	Phe	Gly	Val	Ile	Ile	Gly	Gln	Lys	370	375	380
Ser	Met	Met	Gly	Gly	Gly	Leu	Ala	Glu	Ile	Pro	Gly	Leu	Ser	Ile	Asn	385	390	395
Phe	Ala	Lys	Val	Leu	His	Gly	Glu	Gln	Tyr	Leu	Glu	Leu	Tyr	Lys	Pro	405	410	415
Leu	Pro	Arg	Ala	Gly	Lys	Leu	Lys	Cys	Glu	Ala	Val	Val	Ala	Asp	Val	420	425	430
Leu	Asp	Lys	Gly	Ser	Gly	Val	Val	Ile	Ile	Met	Asp	Val	Tyr	Ser	Tyr	435	440	445
Ser	Glu	Lys	Glu	Leu	Ile	Cys	His	Asn	Gln	Phe	Ser	Leu	Phe	Leu	Val	450	455	460
Gly	Ser	Gly	Gly	Phe	Gly	Gly	Lys	Arg	Thr	Ser	Asp	Lys	Val	Lys	Val	465	470	475
Ala	Val	Ala	Ile	Pro	Asn	Arg	Pro	Pro	Asp	Ala	Val	Leu	Thr	Asp	Thr	485	490	495

1	5	10	15
Ala Gly Ala Gly Leu Gly Arg Ala Tyr Ala Leu Ala Phe Ala Glu Arg	20	25	30
Gly Ala Leu Val Val Val Asn Asp Leu Gly Gly Asp Phe Lys Gly Val	35	40	45
Gly Lys Gly Ser Leu Ala Ala Asp Lys Val Val Glu Glu Ile Arg Arg	50	55	60
Arg Gly Gly Lys Ala Val Ala Asn Tyr Asp Ser Val Glu Glu Gly Glu	65	70	75
Lys Val Val Lys Thr Ala Leu Asp Ala Phe Gly Arg Ile Asp Val Val	85	90	95
Val Asn Asn Ala Gly Ile Leu Arg Asp Arg Ser Phe Ala Arg Ile Ser	100	105	110
Asp Glu Asp Trp Asp Ile Ile His Arg Val His Leu Arg Gly Ser Phe	115	120	125
Gln Val Thr Arg Ala Ala Trp Glu His Met Lys Lys Gln Lys Tyr Gly	130	135	140
Arg Ile Ile Met Thr Ser Ser Ala Ser Gly Ile Tyr Gly Asn Phe Gly	145	150	155
Gln Ala Asn Tyr Ser Ala Ala Lys Leu Gly Leu Leu Gly Leu Ala Asn	165	170	175
Ser Leu Ala Ile Glu Gly Arg Lys Ser Asn Ile His Cys Asn Thr Ile	180	185	190
Ala Pro Asn Ala Gly Ser Arg Met Thr Gln Thr Val Met Pro Glu Asp	195	200	205
Leu Val Glu Ala Leu Lys Pro Glu Tyr Val Ala Pro Leu Val Leu Trp	210	215	220
Leu Cys His Glu Ser Cys Glu Glu Asn Gly Gly Leu Phe Glu Val Gly	225	230	235
Ala Gly Trp Ile Gly Lys Leu Arg Trp Glu Arg Thr Leu Gly Ala Ile	245	250	255
Val Arg Gln Lys Asn His Pro Met Thr Pro Glu Ala Val Lys Ala Asn	260	265	270
Trp Lys Lys Ile Cys Asp Phe Glu Asn Ala Ser Lys Pro Gln Ser Ile	275	280	285
Gln Glu Ser Thr Gly Ser Ile Ile Glu Val Leu Ser Lys Ile Asp Ser	290	295	300
Glu Gly Gly Val Ser Ala Asn His Thr Ser Arg Ala Thr Ser Thr Ala			

